DOE/ID-11323
Revision 1

HWMA/RCRA Closure Plan for the CPP-640 Headend Storage Tank System

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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

ABSTRACT

This Hazardous Waste Management Act/Resource Conservation and Recovery Act closure plan for the CPP-640 Headend Storage Tank System was developed to meet interim status tank system closure requirements. The Headend Storage Tank System is located in the Headend Processing Plant (CPP-640), at the Idaho Nuclear Technology and Engineering Center, Idaho National Laboratory Site. The tank system includes three tanks (VES-HW-100, VES-HW-101, and VES-HW-102) and associated ancillary piping and equipment. The CPP-640 Headend Storage Tank System will be "clean closed" in accordance with the requirements of the Hazardous Waste Management Act/Resource Conservation and Recovery Act as implemented by Idaho Administrative Procedures Act 58.01.05.009 and 40 Code of Federal Regulations 265. This closure plan presents the closure performance standards and methods of achieving those standards for the CPP-640 Headend Storage Tank System.

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ACRONYMS

AL	action level
CFR	Code of Federal Regulations
COC	contaminant of concern
DEQ	State of Idaho Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HWMA	Hazardous Waste Management Act
HWN	hazardous waste number
IDAPA	Idaho Administrative Procedures Act
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
ND	not detected
PE	professional engineer
RCRA	Resource Conservation and Recovery Act
USC	United States Code

HWMA/RCRA Closure Plan for the CPP-640 Headend Storage Tank System

1. INTRODUCTION

This Hazardous Waste Management Act (HWMA) (State of Idaho 1983)/Resource Conservation and Recovery Act (RCRA) (42 United States Code [USC] 6901 et seq. 1976) closure plan has been prepared to address the closure of the CPP-640 Headend Storage Tank System located at the Idaho Nuclear Technology and Engineering Center (INTEC), Idaho National Laboratory (INL) Site. The CPP-640 Headend Storage Tank System includes Tanks VES-HW-100, VES-HW-101, and VES-HW-102 and associated ancillary piping and equipment that were included in the "HWMA/RCRA Part A Permit Application for the INL Volume 1 CH2M-WG Idaho, LLC" (PER-101) for potential management of corrosive wastes (U.S. Environmental Protection Agency [EPA] hazardous waste number [HWN] D002). Upon completion of the activities specified in this closure plan, the CPP-640 Headend Storage Tank System will be certified as closed in accordance with the interim status requirements of Idaho Administrative Procedures Act (IDAPA) 58.01.05.009 and 40 Code of Federal Regulations (CFR) 265, Subparts G and J.

This HWMA/RCRA closure plan includes a general description of the CPP-640 Headend Storage Tank System and a description of the system components for which decontamination activities will be completed under closure. The current and maximum hazardous waste inventories are identified in this closure plan along with the applicable EPA HWNs. System components that managed HWMA/RCRA hazardous waste will be decontaminated to the site-specific action levels (ALs) specified in this closure plan. The tank system will be considered HWMA/RCRA "clean closed" when the closure activities identified in this plan are complete, as certified by an independent, registered professional engineer (PE) and accepted by the State of Idaho Department of Environmental Quality (DEQ).

This plan was developed to address clean closure of the CPP-640 Headend Storage Tank System in compliance with HWMA/RCRA interim status regulations. Residual radioactive contamination will be addressed under a separate regulatory authority.

2. FACILITY DESCRIPTION

2.1 Site Description

The INL Site encompasses approximately 890 mi^2 on the Eastern Snake River Plain in southeastern Idaho, west of Idaho Falls. Within the laboratory complex are eight major applied engineering, interim storage, and research and development facilities. Established in 1949 as the National Reactor Testing Station, the INL continues to safely build, test, and operate various types of nuclear reactor facilities for the United States Government.

The INTEC facility is situated on the south-central portion of the INL Site (Figure 1) and occupies an enclosed and secured area of approximately 0.39 mi^2. Work at INTEC includes receiving and storing spent nuclear fuel; environmental restoration; radiological deactivation, decontamination, and decommissioning activities; and mixed waste treatment.

Figure 1. Map of the INL Site.

2.2 Facility Description and Operational History

The CPP-640 Headend Processing Plant, originally designated as the Headend Pilot Plant, was constructed in 1961 to support research and process development in support of the uranium reprocessing mission in CPP-601. The CPP-640 Headend Processing Plant contains two shielded waste collection tank vaults at the lowest level of the building, five shielded test cells at building mid-level (designated as Cells 1–5), and an open crane loft with space for chemical makeup equipment and access to the cells through roof hatches at the upper level. A major modification in the late 1970s added the shielded Material Handling Cave within the crane loft.

The CPP-640 Headend Storage Tank System received decontamination fluids generated by the Headend Processing Plant. The tank system includes two radiological waste tanks (VES-HW-100 and VES-HW-101), a nonradiological waste tank (VES-HW-102), and the containment structures and ancillary piping and equipment associated with these tanks (see Figure 2).

The waste tanks were designated as “hot” (VES-HW-100), “warm” (VES-HW-101), and “cold” (VES-HW-102) according to the relative level of radioactivity in the wastes they were designed to receive and/or the origin of the wastes discharged to the tanks. Tanks VES-HW-100 and VES-HW-101 received wastes by gravity drainage through floor drains and/or jetting through wall drains located in the process cells. Tank VES-HW-102 received nonhazardous water infiltration into CPP-640 and floor washing solutions from the operating areas of CPP-640. Each tank is horizontal and constructed of Type 304L stainless steel with an approximate capacity of 500 gal, dimensions of 7 ft in length by 3 ft in width, and a diameter of 6 in. Tanks VES-HW-100 and VES-HW-101 are located in the radioactive waste tank vault and Tank VES-HW-102 is located in the adjacent nonradioactive waste tank vault. Each vault contains a vault sump; SU-HW-104 is located in the radioactive waste tank vault and SU-HW-106 is located in the nonradioactive waste tank vault. The concrete walls and floor of the vaults are painted with an epoxy-type coating.

Wastes collected in the radiological waste tanks can be transferred to the CPP-601 deep tanks (via transfer to Tank VES-HW-102) or to the westside waste holdup tanks located in Building CPP-641. Subsequent to transfer, wastes are either processed through the INTEC Liquid Waste Management System, a RCRA-permitted treatment system, or were historically transferred to the Tank Farm Facility for storage. Wastes collected in VES-HW-102 can be transferred to either of the radiological waste tanks, the westside waste holdup tanks, or to the CPP-601 deep tanks (see Figure 2).

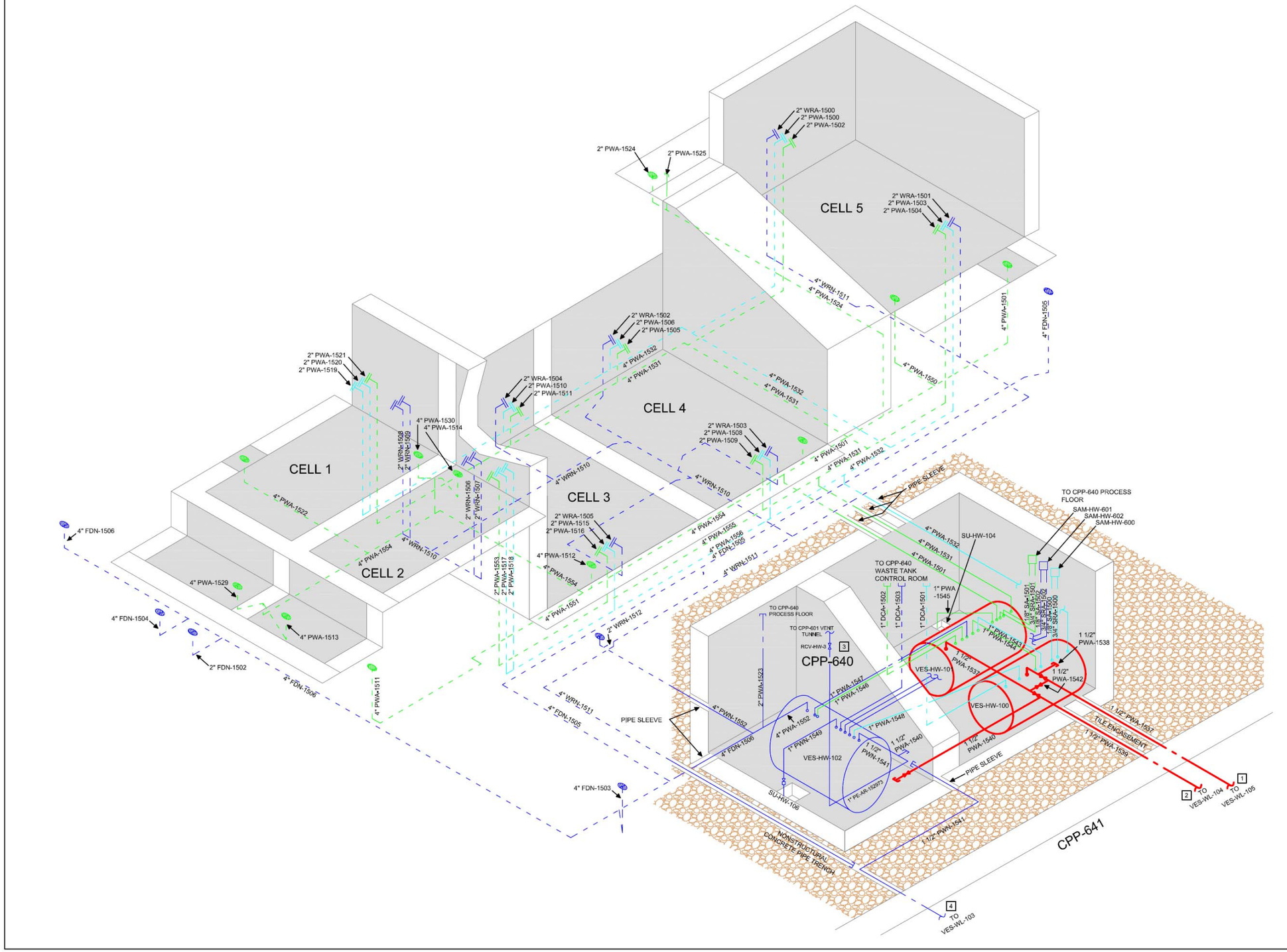
All piping associated with the CPP-640 Headend Storage Tank System is constructed of Type 347 stainless steel. The VES-HW-100 and VES-HW-101 discharge lines (1 1/2” PWA-1537 and 1 1/2” PWA-1539) to the westside waste holdup tanks are encased in vitrified clay tiles (Figure 3). These lines were administratively taken out of service in 1992 and have not been used since the tanks were emptied in 1985. The lines are pitched to drain both ways from a high point south of CPP-640, which is now covered by the concrete pad for an electrical switchgear, and are still connected at both ends. The VES-HW-102 discharge line (1 1/2” PWA-1541 [abandoned]) to the westside waste holdup tanks is direct-buried from the point it exits CPP-640 to the point it enters a nonstructural concrete pipe trench, as shown in Figure 3. A new RCRA-compliant discharge line (1” PE-AR-152973) was installed at that time, which allowed continued use of the tank to collect water infiltration. The new discharge line was configured to discharge directly to the CPP-601 deep tanks.

2.3 Tank System Boundaries

The tank system boundaries, shown in Figure 2, were established to define the breakpoints between the CPP-640 Headend Storage Tank System and the RCRA-permitted CPP-641 and CPP-601 systems. For simplification, only downstream boundaries are listed in Table 1 and shown on Schematic P-CLOS-CPP-640 (Figure 2). Upstream boundaries of the tank system are considered to be the beginning of each line in Cells 1–5, the CPP-640 process floor, or the CPP-640 waste tank control room.

Table 1. CPP-640 system boundaries.

Boundary No.	Description
1	Discharge line 1 1/2” PWA-1537 is included in the tank system to the connection with Tank VES-WL-105. VES-WL-105 will be addressed during closure of the CPP-641 Westside Waste Holdup Tank System.
2	Discharge line 1 1/2” PWA-1539 is included in the tank system to the connection with Tank VES-WL-104. VES-WL-104 will be addressed during closure of the CPP-641 Westside Waste Holdup Tank System.
3	Discharge line 1” PE-AR-152973 is included in the tank system from Tank VES-HW-102 to valve RCV-HW-3. The portion of this line beyond valve RCV-HW-3 will be addressed during closure of the CPP-601 deep tanks, a RCRA-permitted tank system.
4	Discharge line 1 1/2” PWA-1541 [abandoned] is included in the tank system from Tank VES-HW-102 to the connection with Tank VES-WL-103. VES-WL-103 will be addressed, as necessary, during closure of the CPP-641 Westside Waste Holdup Tank System.



LEGEND

- VES-HW-100 AND ASSOCIATED ANCILLARY PIPING
- VES-HW-100 ANCILLARY PIPING EMBEDDED IN CONCRETE
- VES-HW-101 AND ASSOCIATED ANCILLARY PIPING
- VES-HW-101 ANCILLARY PIPING EMBEDDED IN CONCRETE
- VES-HW-102 AND ASSOCIATED ANCILLARY PIPING
- VES-HW-102 ANCILLARY PIPING EMBEDDED IN CONCRETE
- UNITS AND PIPING REQUIRING CLOSURE ACTIVITIES UNDER THIS CLOSURE PLAN
- PIPING EMBEDDED IN CONCRETE REQUIRING CLOSURE ACTIVITIES UNDER THIS CLOSURE PLAN
- [#] CLOSURE BOUNDARY
- SOIL

CLOSURE BOUNDARIES

1. DISCHARGE LINE 1 1/2" PWA-1537 IS INCLUDED IN THE TANK SYSTEM TO THE CONNECTION WITH TANK VES-WL-105. VES-WL-105 WILL BE ADDRESSED DURING CLOSURE OF THE CPP-641 WESTSIDE WASTE HOLDUP TANK SYSTEM.
2. DISCHARGE LINE 1 1/2" PWA-1539 IS INCLUDED IN THE TANK SYSTEM TO THE CONNECTION WITH TANK VES-WL-104. VES-WL-104 WILL BE ADDRESSED DURING CLOSURE OF THE CPP-641 WESTSIDE WASTE HOLDUP TANK SYSTEM.
3. DISCHARGE LINE 1" PE-AR-152973 IS INCLUDED IN THE TANK SYSTEM FROM TANK VES-HW-102 TO VALVE RCV-HW-3. THE PORTION OF THIS LINE BEYOND VALVE RCV-HW-3 WILL BE ADDRESSED DURING CLOSURE OF THE CPP-601 DEEP TANKS, A RCRA-PERMITTED TANK SYSTEM.
4. DISCHARGE LINE 1 1/2" PWA-1541 IS INCLUDED IN THE TANK SYSTEM TO THE CONNECTION WITH VES-WL-103. VES-WL-103 WILL BE ADDRESSED, AS NECESSARY, DURING CLOSURE OF THE CPP-641 WESTSIDE WASTE HOLDUP TANK SYSTEM.

REFERENCE DRAWINGS

055060, REV. 31
094762, REV. 18
111674, REV. 9
111757, REV. 22
111758, REV. 10
111761, REV. 10
111767, REV. 13
111804, REV. 25

NOTES

IDAHO CLEANUP PROJECT

THIS SCHEMATIC IS PROVIDED AS A SUPPLEMENT TO THE HWMA/RCRA CLOSURE PLAN FOR CPP-640. THIS SCHEMATIC IS FOR CLOSURE PURPOSES ONLY AND IS NOT INTENDED TO BE USED AS A PIPING AND INSTRUMENTATION DIAGRAM NOR IS IT MANAGED BY ICP CONFIGURATION CONTROL.

REVISIONS

REV	DESCRIPTION	EFFECTIVE DATE

Portage ENVIRONMENTAL
IDAHO OPERATIONS OFFICE
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IDAHO CLEANUP PROJECT
IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER
CPP-640 HWMA/RCRA CLOSURE
PLOT PLAN AND DETAILS

SHEET: 1 OF 1		SCALE: NONE	
DESIGN: N/A	N/A	QA LEVEL: STD	DWG SIZE: B
DRAWN: H.C. GUERRERO	03/06/07	CONTRACT NO.: 2126.18	
CHECKED: N.M. WHELDON	03/06/07	DRAWING NUMBER:	REV
APPROVED: B.J. ORCHARD	06/14/07	P-CLOS-CPP-640	0

Figure 2. Schematic P-CLOS-CPP-640. CPP-640 plot plan and details.

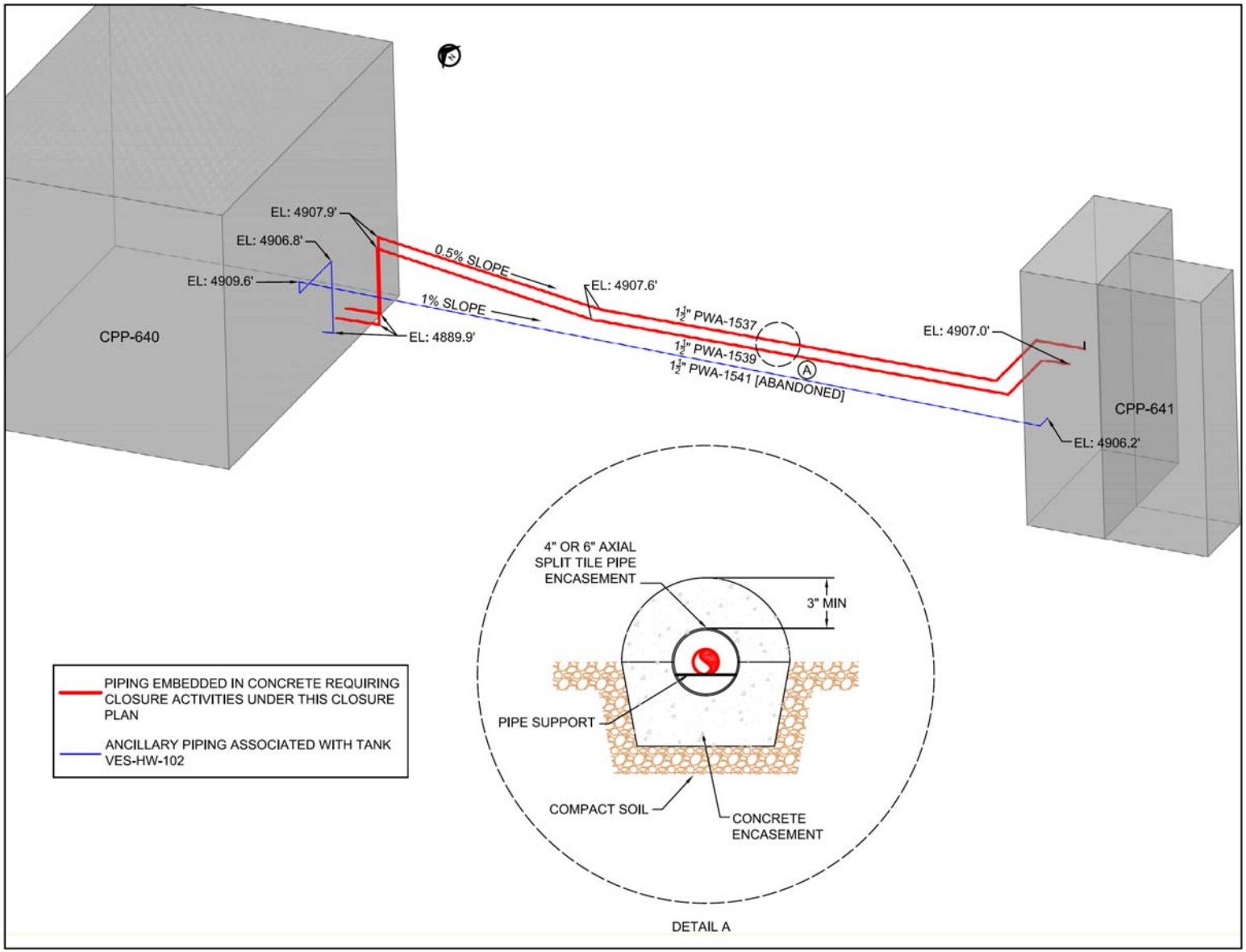

Figure 3. Transfer lines to the westside waste holdup tanks.

2.4 Units and Ancillary Equipment Subject to Closure Activities

The units and associated ancillary equipment for which closure activities will be conducted under this closure plan are shown on Figures 2 and 3. The following subsections provide additional information on those units and components for which decontamination activities will be conducted as part of HWMA/RCRA closure of the CPP-640 Headend Storage Tank System.

2.4.1 Units

The CPP-640 Headend Storage Tank System tanks are included in the "HWMA/RCRA Part A Permit Application for the INL Volume 1 CH2M-WG Idaho, LLC" (PER-101) for potential management of corrosive wastes (EPA HWN D002). However, decontamination activities will only be conducted for the radiological waste tanks (VES-HW-100 and VES-HW-101). Process knowledge indicates that Tank VES-HW-102 was confirmed not to contain hazardous waste in 1985 and that the tank was used primarily to manage rainwater infiltration to the CPP-640 building from that point forward. There are no records of discharges of hazardous waste to this tank after 1985. Analytical data from full-suite analysis of tank contents in May 1990 demonstrating that the VES-HW-102 tank wastes were not HWMA/RCRA hazardous are presented in Appendix A. A visual examination will be conducted of this tank during closure activities to determine the presence of solids in the tank. If hazardous solids are not identified in the tank, no closure activities will be conducted for the tank and associated ancillary piping and equipment, including input and transfer lines, discharge lines, and containment structures, as shown on Figures 2 and 3. If HWMA/RCRA hazardous solids are determined to be present, this closure plan will be amended to include closure actives for VES-HW-102 and ancillary piping and equipment associated with this tank.

2.4.2 Containment Structures

The discharge piping from Tanks VES-HW-100 and VES-HW-101 to the westside waste holdup tanks is secondarily contained in a vitrified tile encasement that is pitched such that any liquids released from the pipe into the tile encasement would have gravity-drained directly to either the CPP-640 radiological waste tank vault or the CPP-641 westside waste holdup tanks vault. These vaults would have provided additional containment for any liquids should the lines have leaked. There are no known accumulations of waste in either vault attributable to the vitrified tile encasements associated with the VES-HW-100 and VES-HW-101 discharge lines. There is also no evidence of a release of corrosive wastes (i.e., visible waste-related staining) from either the radiological waste tanks (VES-HW-100 and VES-HW-101) to the radiological waste tank vault. Therefore, no closure activities will be conducted for the radiological waste tank vault and associated sump (SU-HW-104) or for the vitrified tile encasements for lines 1 1/2" PWA-1537 and 1 1/2" PWA-1539 and associated soils.

2.4.3 Associated Piping and Ancillary Equipment

Tanks VES-HW-100 and VES-HW-101 received waste from floor and wall drains located in Cells 1–5. Approximately 35% (based on pipe length) of the inlet piping for these two vessels was visually inspected in 2006 as part of pre-closure activities and determined to contain minimal amounts of residual material. Based on the material of construction (Type 347 stainless steel) and configuration of the piping (gravity-drain without obstruction), it is reasonable to assume that the remainder of the inlet piping is in a similar condition and that no integrity or waste holdup issues exist for the inlet piping to Tanks VES-HW-100 and VES-HW-101.

Following visual inspection of the inlet piping, each tank system (Tank VES-HW-100 and associated inlet and transfer piping and Tank VES-HW-101 and associated inlet and transfer piping) was steamed, with the resultant steam condensates collected in the associated tank. Condensates were sampled and analyzed for volatile organic compounds, semivolatile organic compounds, and metals. The resulting analytical data showed concentrations for all contaminants of concern (COCs) below RCRA toxicity characteristic levels, below Universal Treatment Standard levels, and below the ALs specified in Table 2 of this closure plan. Based on this information, no further closure activities will be conducted for the inlet and transfer piping associated with Tanks VES-HW-100 and VES-HW-101.

Wastes stored in Tanks VES-HW-100 and VES-HW-101 were discharged to the westside waste holdup tanks via lines 1 1/2" PWA-1537 and 1 1/2" PWA-1539. As discussed previously, there is no evidence of waste discharges to the vitrified tile encasements. Therefore, these discharge lines will be decontaminated with Tanks VES-HW-100 and VES-HW-101 as part of closure activities.

The high-pressure air lines and off-gas vent lines associated with the CPP-640 Headend Storage Tank System did not manage HWMA/RCRA hazardous waste. Therefore, no closure activities will be conducted for these lines.

3. CURRENT AND MAXIMUM WASTE INVENTORIES AND CHARACTERISTICS

The CPP-640 Headend Storage Tank System is included in the Part A permit application for possible management of wastes exhibiting the characteristic of corrosivity (EPA HWN D002) (PER-101). Based on a review of operations and activities conducted at CPP-640, no listed waste was discharged to the CPP-640 Headend Storage Tank System.

Instrument readings indicate that Tanks VES-HW-100 and VES-HW-101 are not currently receiving liquids. However, bulk solids have been observed in Tank VES-HW-101 while only residual scaling (no bulk solid waste) has been observed in Tank VES-HW-100. It is currently unknown whether solids are present in VES-HW-102, which continues to receive water infiltration from Building CPP-640. The tank system has a process design capacity of 1,500 gal (500 gal per tank) (see Table 2).

Table 2. CPP-640 Headend Storage Tank System current and maximum waste inventory.

Component	Pre-Closure Waste Inventory (gal)	Maximum Unit Capacity (gal)	Applicable EPA HWN
VES-HW-100	Residual	500	D002 (corrosivity)
VES-HW-101	14[a]	500	D002
VES-HW-102	<1	500	D002
Inlet and Transfer Piping	Residual[b]	0	D002
Discharge Piping	Residual[c]	0	D002

a. Waste volume calculated based on video inspections of the tank.

b. The configuration of these lines is such that any liquids discharged to the lines would have gravity-drained directly to the radiological waste tanks without obstruction. Therefore, only residual amounts of waste, if any, are expected to be present within the lines.

c. The configuration of the discharge piping is such that following waste transfer, any remaining liquids in the lines would have gravity-drained to either the CPP-640 or CPP-641 tanks. Therefore, only residual amounts of waste, if any, are expected to be present within the lines.

4. CLOSURE PERFORMANCE STANDARDS

This section describes the performance standards for closure of the CPP-640 Headend Storage Tank System (IDAPA 58.01.05.009 [40 CFR 265.111 and 265.197]) and the activities that will be conducted to demonstrate that the closure performance standards have been met.

4.1 Regulatory Closure Performance Standards

The closure performance standards identified in IDAPA 58.01.05.009 (40 CFR 265.111 and 265.197) applicable to the CPP-640 Headend Storage Tank System closure are:

1. The owner or operator must close the facility in a manner that minimizes the need for further maintenance (IDAPA 58.01.05.009 [40 CFR 265.111(a)]).

2. The owner or operator must close the facility in a manner that controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere (IDAPA 58.01.05.009 [40 CFR 265.111(b)]).

3. The owner or operator must close the facility in a manner that complies with the closure requirements of this subpart, including, but not limited to, the requirements of 40 CFR 265.197, 265.228, 265.258, 265.280, 265.310, 265.351, 265.381, 265.404, and 265.1102 (IDAPA 58.01.05.009 [40 CFR 265.111(c)]).

4.2 Required Activities for Achieving Closure Performance Standards

The CPP-640 Headend Storage Tank System closure and waste management activities to be conducted under HWMA/RCRA closure are described in detail in Section 5 of this closure plan. The closure performance standards will be achieved by the following measures.

4.2.1 Standard 1

The owner or operator must close the facility in a manner that minimizes the need for further maintenance (IDAPA 58.01.05.009 [40 CFR 265.111(a)]).

This closure performance standard will be achieved by the following measures:

- The hazardous waste inventory will be removed and disposed of or treated to meet RCRA standards

- Tank system components undergoing HWMA/RCRA closure will be decontaminated to the site-specific ALs specified in this HWMA/RCRA closure plan.

4.2.2 Standard 2

The owner or operator must close the facility in a manner that controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of hazardous

waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere (IDAPA 58.01.05.009 [40 CFR 265.111(b)]).

This closure performance standard will be achieved by the following measures:

- The hazardous waste inventory will be removed and disposed of or treated to meet RCRA standards

- Tank system components undergoing HWMA/RCRA closure will be decontaminated to the site-specific ALs specified in this HWMA/RCRA closure plan.

4.2.3 Standard 3

At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless §261.3(d) of this Chapter (CFR Title 40) applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for the tank systems must meet all of the requirements specified in subparts G and H of this part (IDAPA 58.01.05.009 [40 CFR 265.197(a)]).

This closure performance standard will be achieved by the following measures:

- The hazardous waste inventory will be removed and disposed of or treated to meet RCRA standards.

- Tank system components undergoing HWMA/RCRA closure will be decontaminated to the site-specific ALs specified in this HWMA/RCRA closure plan.

- There have been no known releases of hazardous waste to the containment structures for the tanks and piping subject to closure activities under this closure plan (see Subsection 2.4). Therefore, no activities with regard to potentially contaminated containment system components, soils, or structures will be conducted as part of closure activities for the CPP-640 Headend Storage Tank System.

5. CLOSURE ACTIVITIES

This closure plan describes the methods for closing the CPP-640 Headend Storage Tank System per the interim status tank system closure performance standard requirements of IDAPA 58.01.05.009 (40 CFR 265, Subparts G and J). The approach for closure of the CPP-640 Headend Storage Tank System will be decontamination to the site-specific ALs specified in Table 3 of this HWMA/RCRA closure plan. The following subsections describe closure activities, waste management activities, and required closure documentation to satisfy the tank system closure performance standards for those units and associated ancillary equipment for which closure activities will be performed, as identified in Subsection 2.4.

5.1 Identification and Removal of Hazardous Waste

5.1.1 Hot Waste Tank (VES-HW-100)

A video inspection was performed on the hot waste tank (VES-HW-100) on July 26, 2006, to evaluate residual waste inventory remaining in the tank. The tank was determined to contain no liquids and a minimal amount of scaling (no bulk solid waste) (see Figure 4). Therefore, no waste removal activities will be conducted as part of HWMA/RCRA closure activities for this tank.

Figure 4. Internal view of the CPP-640 hot waste tank (VES-HW-100).

5.1.2 Warm Waste Tank (VES-HW-101)

A video inspection was performed on the warm waste tank (VES-HW-101) on July 26, 2006, to evaluate residual waste inventory remaining in the tank. The tank was determined to contain no liquids and approximately 14 gal of residual solids (see Figure 5). Characterization samples of the residual solids were collected in April 2007. Sample results indicate that the residual solids in Tank VES-HW-101 are nonhazardous; therefore, decontamination activities may proceed without removal of the limited quantity of solids in the tank.

Figure 5. Internal view of the CPP-640 warm waste tank (VES-HW-101).

5.1.3 Cold Waste Tank (VES-HW-102)

A visual examination will be conducted of VES-HW-102 during closure activities to determine the presence of solids in the tank. If HWMA/RCRA hazardous solids are determined to be present, this closure plan will be amended to include closure activities for this tank and associated ancillary piping and equipment.

5.2 Decontamination Activities

The radiological waste Tanks VES-HW-100 and VES-HW-101 will be closed under HWMA/RCRA by iteratively decontaminating each tank, as necessary. The tank system was designed to manage aqueous solutions and primarily managed aqueous decontamination solutions and water infiltration; therefore, water is an appropriate decontamination agent for the system. Water will be used for the final decontamination cycle and is representative of potential leaching liquid that would contact the closed tank system. The final rinsate solutions from decontamination efforts of the radiological waste tanks will be transferred to the westside waste holdup tanks. Thus, the 1 1/2-in. discharge lines from Tanks VES-HW-100 and VES-HW-101 (1 1/2” PWA-1537 and 1 1/2” PWA-1539) will be decontaminated concurrently with the respective tank. Final rinsate samples will be collected in accordance with the *Sampling Procedure for HWMA/RCRA Closure of the CPP-640 Headend Storage Tank System* (SPR-170) immediately upstream of the piping connection with the associated waste tank in CPP-641. Each tank and its respective discharge line will be grouped as a subunit for the purposes of closure certification sampling.

Prior to sampling the final rinsate solutions, the pH of the rinsate solution will be determined using field methods to ensure that the rinsates do not exhibit the characteristic of corrosivity as defined in IDAPA 58.01.05.005 [40 CFR 261.22]. If the rinsate solution exhibits the characteristic of corrosivity,

further decontamination efforts will be conducted until the pH of the rinsate solution is greater than 2 and less than 12.5.

Compliance with the closure performance standards will be demonstrated by sampling the final rinsate solutions from the decontamination efforts and comparing the resulting analytical data with the site-specific ALs provided in Table 3. Process knowledge and the results from fall 2006 pre-closure steaming activities limit the contaminants of concern (COCs) for the CPP-640 Headend Storage Tank System to chromium, nickel, and lead. To be conservative, ALs were developed for the contract laboratory program metals listed in Table 3. The ALs were developed by defining the acceptable excess cancer risk and hazard quotient thresholds, and calculating corresponding ALs based upon these risk and hazard thresholds. These ALs were developed to ensure that the units and ancillary equipment, subsequent to completion of closure activities, will be left in a state that is protective of human health and the environment. If additional HWMA/RCRA COCs are identified during closure, ALs may be revised, as necessary, to account for these additional COCs.

Following completion of closure activities, liquids may remain within the CPP-640 Headend Storage Tank System; however, these liquids will have met the site-specific ALs specified below and will not constitute a hazardous waste. Therefore, removal of such liquids will not be required.

Table 3. Contaminants of concern and corresponding site-specific action level.

Contaminant of Concern	Chemical Abstract Service Number	Action Level (mg/kg - mg/L rinsate)
Antimony	7440-36-0	8.9E+01
Arsenic	7440-38-2	3.0E+00
Barium	7440-39-3	5.9E+01
Beryllium	7440-4-17	3.9E+01
Cadmium	7440-43-9	5.9E–01
Chromium	7440-47-3	3.0E+00
Lead	7439-92-1	2.5E–01
Mercury	7439-97-6	1.2E–01
Nickel	7440-02-0	8.9E+01
Selenium	7782-49-2	5.9E–01
Silver	7440-22-4	3.0E+00
Thallium	7440-28-0	6.6E+01
Vanadium	7440-62-2	8.9E+01
Zinc	7440-66-6	8.9E+01

5.3 Waste Management

As required by IDAPA 58.01.05.009 (40 CFR 265.114), contaminated equipment and structures must be properly disposed of or decontaminated in accordance with applicable requirements. Waste generated during closure activities may include nonhazardous industrial waste, nonhazardous liquid

waste, HWMA/RCRA hazardous waste, and mixed waste. All closure-generated wastes will undergo a hazardous waste determination in accordance with IDAPA 58.01.05.006 (40 CFR 262.11). All hazardous waste will be managed in accordance with the generator requirements of IDAPA 58.01.05.006 (40 CFR 262) and will be disposed of appropriately (e.g., RCRA hazardous waste transferred to/disposed of at a RCRA-permitted treatment, storage, and disposal facility). Information regarding waste management during closure activities will be provided to the independent, registered PE for closure certification and will be maintained as part of the project file.

5.4 Closure Documentation

Closure methods and attainment of the closure performance standards for units and components being HWMA/RCRA closed will be documented by performing the following:

- Closure activities will be monitored and reviewed by an independent, registered PE. Following successful completion of closure activities, the PE will certify that the closure was performed in accordance with the DEQ-approved closure plan.

- Information related to successful implementation of closure activities will be recorded or documented, and provided to the PE, as requested, to support closure certification. Successful demonstration of achieving closure performance standards will require documentation of the following:

    - Waste management

    - Documentation of decontamination activities specified in this closure plan, including procedures, work orders, validated sampling data, and data quality assessment report(s), as appropriate

    - Documentation of the visual inspection and sampling results, as applicable, of Tank VES-HW-102.

6. CLOSURE SCHEDULE

Table 4 identifies the closure schedule that will be initiated following DEQ approval of this closure plan. This schedule reflects the time required for conducting closure activities and submitting information to the independent, registered PE for certification. IDAPA 58.01.05.009 (40 CFR 265.113) requires waste removal activities to be completed 90 days from the approval of the closure plan and closure to be completed within 180 days from the initiation of closure activities. An extension to these time periods is being requested at this time, pursuant to IDAPA 58.01.05.009 (40 CFR 265.113), to ensure that data of adequate quality are collected to show compliance with the closure performance standard. An extension is requested for the 180-day closure period to protect human health and the environment and to adequately perform closure activities. Waste removal, decontamination, and closure activities cannot be completed within these timeframes due to several factors including, but not limited to, the following:

- The need to provide radiological contamination controls to prevent the possible spread of contamination
- All work related to management of radioactive mixed waste requires additional time due to the requirements for care in work planning, including radiological work permits
- Tank flushing activities and other closure activities will require coordination with ongoing INTEC Liquid Waste Management System operations, ongoing decontamination and decommissioning activities for CPP-601, and planned closure and decontamination and decommissioning activities for CPP-641
- The time necessary for the analytical laboratories to complete analysis of samples and data validation, receive analytical results, and complete data quality assessment, as specified in the sampling procedure associated with this closure plan (SPR-170), to determine if the closure performance standards have been met
- Complexities of accessing the tanks due to the radiological environment and the physically constraining configuration of the radiological waste tank vault.

Table 4. CPP-640 Headend Storage Tank System closure schedule.

Activity	Completion
DEQ approval of closure plan	Day 0
Complete decontamination of Tanks VES-HW-100 and VES-HW-101 and associated discharge lines (1 1/2” PWA-1537 and 1 1/2” PWA-1539)	Day 180
Visual examination of Tank VES-HW-102 and complete sampling if residual solids are determined to be present	Day 240
Collection of closure certification samples, including laboratory analysis, data validation, and data quality assessment	Day 320
Closure activities complete	Day 340
PE and owner/operator certification submitted to DEQ within 60 days of completion of closure	Day 400[a]

a. If closure activities are completed ahead of the proposed schedule, DOE will submit the closure certification to DEQ within 60 days of the completion of closure activities.

7. CLOSURE PLAN AMENDMENTS

The conditions described in IDAPA 58.01.05.009 (40 CFR 265.112), "Closure Plan; Amendment of Plan," will be followed to implement changes to the approved closure plan. Should unexpected events during the closure period require modification of the approved closure activities or closure schedule, the closure plan will be amended or the DEQ will be otherwise notified within 30 days of the unexpected event. A written request detailing the proposed changes and the rationale for those changes, and a copy of the amended closure plan will be submitted to DEQ for approval or DEQ will be otherwise notified. Minor deviations from the approved closure plan, which are equivalent to or do not compromise the closure requirements and performance standards identified in the approved closure plan, may be made without prior notification to DEQ. Minor deviations will be identified in the documentation supporting the independent, registered PE certification.

8. CERTIFICATION OF CLOSURE

Within 60 days of completing the closure activities, a certification of closure of the CPP-640 Headend Storage Tank System will be completed, in accordance with IDAPA 58.01.05.009 (40 CFR 265.115), by an independent, registered PE and the U.S. Department of Energy Idaho Operations Office. The PE and owner/operator signatures on the closure certification, which is submitted to the DEQ, will document the completion of closure activities in accordance with the approved closure plan and State of Idaho HWMA/RCRA requirements. The closure certification may also identify any minor changes to the closure plan made without prior approval of the DEQ. Closure of the CPP-640 Headend Storage Tank System will be considered complete upon receipt of written acceptance issued by the DEQ. The CPP-640 Headend Storage Tank System is not a hazardous waste disposal facility and, therefore, a “Notice in Deed” and a survey plat are not required.

9. COST AND LIABILITY REQUIREMENTS

The federal government, as owner of the INL Site, is exempt from the requirements to provide cost estimates for closure, to provide a financial assurance mechanism for closure, and regarding state-required mechanism and state assumption of responsibility per IDAPA 58.01.05.009 [40 CFR 265.140(c)]. The federal government, as owner of the INL Site, is also exempt from liability requirements.

10. REFERENCES

40 CFR 261, "Identification and Listing of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register, as amended.

40 CFR 262, "Standards Applicable to Generators of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register, as amended.

40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, Office of the Federal Register, as amended.

40 CFR 268.48, "Universal Treatment Standards," *Code of Federal Regulations*, Office of the Federal Register, as amended.

42 USC 6901 et seq., 1976, "Resource Conservation and Recovery Act of 1976," as amended.

EPA, 2006, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd Edition, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, http://www.epa.gov/epaoswer/hazwaste/test/main.htm, Web page updated April 12, 2006, Web page visited April 12, 2006.

IDAPA 58.01.05.005, "Identification and Listing of Hazardous Waste and Residues of Hazardous Waste in Empty Containers," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality, as amended.

IDAPA 58.01.05.006, "Standards Applicable to Generators of Hazardous Waste," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality, as amended.

IDAPA 58.01.05.009, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality Rules, as amended.

IDAPA 58.01.05.016, "Standards for Universal Waste Management," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality Rules, as amended.

PER-101, 2007, "HWMA/RCRA Part A Permit Application for the INL Volume 1 CH2M-WG Idaho, LLC," Rev. 41, Idaho Cleanup Project, March 7, 2007.

SPR-170, 2007, *Sampling Procedure for the HWMA/RCRA Closure of the CPP-640 Headend Processing Plant Tank System*, as amended.

State of Idaho, 1983, "Hazardous Waste Management," Idaho Statute, Title 39, "Health and Safety," Chapter 44, "Hazardous Waste Management" (also known as the Hazardous Waste Management Act of 1983).

11. DRAWINGS

055060, INL Reference Drawing, *CPP-640 Cell 5 Electrolytic Dissolver Process Flowsheet*, Rev. 31, March 2004.

094762, INL Reference Drawing, *CPP-601Process Building PEW Collection System Flowsheet*, Rev. 18, December 2004.

111674, INL Reference Drawing, *CPP Area Yard Work Utilities Piping Sections and Details, Sheet No. 1*, Rev. 9, December 1993.

111757, INL Reference Drawing, *CPP-640 Hot Pilot Plant Waste Tankage, Piping and Instrument Diagram*, Rev. 22, March 2004.

111758, INL Reference Drawing, *CPP-640 Hot Pilot Plant Piping, Piping Plan Waste Tank Rooms*, Rev. 10, May 1994.

111761, INL Reference Drawing, *CPP-640 Hot Pilot Plant Drainage Piping Plan, Cells and Vent Corridor*, Rev. 10, January 1997.

111767, INL Reference Drawing, *CPP-640 Hot Pilot Plant Drainage Piping Diagram*, Rev. 13, April 2004.

111804, INL Reference Drawing, *CPP-641 Waste Hold Up Tank System Piping, Piping and Inst. Diagram*, Rev. 25, January 2006.

Appendix A

Tank VES-HW-102 1990 Analytical Results

Appendix A

Tank VES-HW-102 1990 Analytical Results

The following table presents analytical results for tank VES-HW-102 resulting from sampling activities conducted in May 1990. Previous analytical results (1985) had indicated that the contents of the tank were nonhazardous. Subsequent to collection of samples in May 1990 operational samples were collected solely to demonstrate compliance with the Process Equipment Waste (PEW) waste acceptance criteria (pH, etc.).

Table A-1. May 1990 analytical results for VES-HW-102.

Analyte	Result (*u*g/L)	Analyte	Result (*u*g/L)
Inorganics		P,P'-DDE	ND
Arsenic	80	P,P'-DDT	ND
Barium	ND	Pentachlorobenzene	ND
Cadmium	ND	Pentachloronitrobenzene	ND
Chromium	ND	Pentachlorophenol	ND
Cyanide	84	Phenacetin	ND
Lead	ND	Phenanthrene	ND
Selenium	ND	Phenol	ND
Silver	14	Pronamide	ND
pH	8.5	Pyrene	ND
Organics		1,1,1-Trichloroethane	ND
Dimethylphenethylamine	ND	1,1,2,2-Tetrchloroethane	ND
1,2,4,5-Tetrachlorobenzene	ND	1,1,2-Trichloroethane	ND
1,2,4-Trichlorobenzene	ND	1,1-Dichloroethane	ND
1,2,-Dichlorobenzene	ND	1,1-Dichloroethene	ND
1,3-Dichlorobenzene	ND	1,2,3-Trichloropropane	ND
1,4-Dichlorobenzene	ND	1,2-Dichlorobenzene	ND
1-Chloronapthalene	ND	1,2-Dichloroethane	ND
1-Napthylamine	ND	1,2-Dichloroethene (total)	ND
2,3,4,6-Tetrachlorophenol	ND	1,2-Dichloropropane	ND
2,4,5-Trichlorophenol	ND	1,3-Dichlorobenzene	ND
2,4,6-Trichlorophenol	ND	1,4-Dichloro-2-butene	ND
2,4-Dichlorophenol	ND	1,4-Dichlorobenzene	ND
2,4-Dimethylphenol	ND	2-Butanone	ND
2,4-Dinitrophenol	ND	2-Chloroethyl vinyl ether	ND
2,4-Dinitrotoluene	ND	2-Hexanone	ND
2,6-Dinitrotoluene	ND	4-Methyl-2-Pentanone	ND
2-Chloronaphthalene	ND	Acetone	ND
2-Chlorophenol	ND	Acrolein	ND
2-Methylnaphthalene	ND	Acrylonitrile	ND

Table A-1. (continued).

Analyte	Result (*u*g/L)	Analyte	Result (*u*g/L)
2-Methylphenol	ND	Benzene	ND
2-Napthylamine	ND	Bromodichloromethane	ND
2-Nitroaniline	ND	Bromoform	ND
2-Nitrophenol	ND	Bromomethane	ND
2-Picoline	ND	Carbon disulfide	ND
3,3'-Dichlorobenzidine	ND	Carbon tetrachloride	ND
3-Methylcholanthrene	ND	Chlorobenzene	ND
3-Nitroaniline	ND	Chloroethane	ND
4,6-Dinitro-2-methylphenol	ND	Chloroform	ND
4-Aminobiohenyl	ND	Chloromethane	ND
4-Bromophenyl phenyl ether	ND	Cis-1.3-Dichloropropene	ND
4-Chloro-3-methylphenol	ND	Dibromochloromethane	ND
4-Chloroaniline	ND	Dibromomethane	ND
4-Chlorophenyl phenyl ether	ND	Dichlorodifluoromethane	ND
4-Methylphenol	ND	Ethyl Methacrylate	ND
4-Nitroaniline	ND	Ethylbenzene	ND
4-Nitrophenol	ND	Iodomethane	ND
7,12-Dimethylbenz(a)anthracene	ND	Methylene chloride	ND
Acenaphthene	ND	Styrene	ND
Acenaphthylene	ND	Tetrachloroethene	ND
Acetophenone	ND	Toluene	ND
Aldrin	ND	Trans-1,3-Dichloropropene	ND
Alpha-BHC	ND	Trichloroethene	ND
Alpha-endosulfan	ND	Trichlorofluoromethane	ND
Aniline	ND	Vinyl acetate	ND
Anthracene	ND	Vinyl chloride	ND
Benzidine	ND	Xylene (meta & para)	ND
Benzo(k)fluoranthene	ND	Xylene (ortho)	ND
Benzo(a)anthracene	ND	1,1,1-Trichloroethane	ND
Benzoic acid	ND	1,1,2,2-Tetrchloroethane	ND
Benzon(a)pyrene	ND	1,1,2-Trichloroethane	ND
Benzon(g,h,i)perylene	ND	1,1-Dichloroethane	ND
Benzyl alcohol	ND	1,1-Dichloroethene	ND
Beonzo(b)fluoranthene	ND	1,2,3-Trichloropropane	ND
Beta-BHC	ND	1,2-Dichlorobenzene	ND
Beta-endosulfan	ND	1,2-Dichloroethane	ND
Bis(2-Chloroethoxy)methane	ND	1,2-Dichloroethene (total)	ND
Bis(2-Chloroethyl)ether	ND	1,2-Dichloropropane	ND
Bis(2-Chloroisopropyl)ether	ND	1,3-Dichlorobenzene	ND

Table A-1. (continued).

Analyte	Result (*u*g/L)	Analyte	Result (*u*g/L)
Bis(2-ethylhexyl)phthalate	ND	1,4-Dichloro-2-butene	ND
Butylbenzylphthalate	ND	1,4-Dichlorobenzene	ND
Chrysene	ND	2-Butanone	ND
Delta-BHC	ND	2-Chloroethyl vinyl ether	ND
Dibenzo(a,h)anthracene	ND	2-Hexanone	ND
Dibenzofuran	ND	4-Methyl-2-Pentanone	ND
Dieldrin	ND	Acetone	ND
Diethyl phthalate	ND	Acrolein	ND
Dimethyl phthalate	ND	Acrylonitrile	ND
Dimethylaminoazobenzene	ND	Benzene	ND
Di-n-butylphthalate	ND	Bromodichloromethane	ND
Di-n-octylphthalate	ND	Bromoform	ND
Diphenylamine	ND	Bromomethane	ND
Endosulfan sulfate	ND	Carbon disulfide	ND
Endrin	ND	Carbon tetrachloride	ND
endrin ketone	ND	Chlorobenzene	ND
Ethylmethanesufonate	ND	Chloroethane	ND
Fluoranthene	ND	Chloroform	ND
Fluorene	ND	Chloromethane	ND
Gamma-BHC	ND	Cis-1.3-Dichloropropene	ND
Heptachlor	ND	Dibromochloromethane	ND
Heptachlor epoxide	ND	Dibromomethane	ND
Hexachlorobenzene	ND	Dichlorodifluoromethane	ND
Hexachlorobutadiene	ND	Ethyl Methacrylate	ND
Hexachlorocyclopentadiene	ND	Ethylbenzene	ND
Hexachloroethane	ND	Iodomethane	ND
Indeno(1,2,3-ed)pyrene	ND	Methylene chloride	ND
Isophorone	ND	Styrene	ND
Methoxychlor	ND	Tetrachloroethene	ND
Methylmethanesulfolnate	ND	Toluene	ND
Naonthalene	ND	Trans-1,3-Dichloropropene	ND
Nitrobenzene	ND	Trichloroethene	ND
N-Nirosodibutylamine	ND	Trichlorofluoromethane	ND
N-Nitrosodimethylamine	ND	Vinyl acetate	ND
N-Nitroso-di-N-propylamine	ND	Vinyl chloride	ND
N-Nitrosodiperidine	ND	Xylene (meta & para)	ND
N-Nitrosoldophenylamine	ND	Xylene (ortho)	ND
P,P'-DDD	ND		

ND = Not detected.